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ABSTRACT

A method and apparatus is disclosed for improving quality-of-service (QoS) by parallel operation in a multiple access network.

A communication system comprises a plurality of communicating nodes and communication facilities linking these nodes. The communication facility is constructed so that it has more than one channel for communication among these communicating nodes using many different means, such as with separate time slots, different frequency bands, coding scheme, separate physical media, or a combination of the above. Each node is assigned a regular communication channel and a contention-resolution channel. In some cases, these two types of channels can be one and the same.

When a collision is detected by the communicating nodes, nodes engaged in the contention switch to the contention-resolution channel for contention resolution process while nodes not engaged in the contention continue their normal operation in the regular channel. After the contention is resolved and communication is accomplished, the nodes that have switched will switch back to their regular channel. Any nodes with existing protocol will simply stay on the regular channel and resolve the contention in the existing fashion. Therefore, backward compatibility is achieved.

The present invention offers a flexible way to adjust for network performance by dynamically allocating channels to be assigned dynamically to communicating nodes. The multiple access operation is improved via parallel operation for non-contending nodes, and smaller group of nodes for contention resolution. Support of different service quality levels based on varying group size is made possible in a multiple access network while providing compatibility with existing protocol. The present invention offers a smooth growth path for protocol and network facility.